2019 IRP Frequently Asked Questions

Sections

1 — Release of Draft Integrated Resource Plan (IRP) and Environmental Impact Statement (EIS)

When did TVA release its draft 2019 Integrated Resource Plan (IRP) and Environmental Impact Statement (EIS)?
TVA released its draft 2019 Integrated Resource Plan (IRP) and draft Environmental Impact Statement (EIS) for public review and comment on Feb. 15, 2019.

What is the IRP?
TVA's 2019 IRP is a comprehensive study that provides direction on how TVA can best meet future demand for power. The IRP will help shape TVA's power-generation system and offer direction on how TVA provides low-cost, reliable electricity; supports environmental stewardship; and fosters economic development in the Tennessee Valley for the next 20 years. TVA released the draft IRP as Volume I on Feb. 15, and stakeholders and the public are invited to comment through April 8.

What is the Environmental Impact Statement (EIS)?
Per the National Environmental Policy Act (NEPA), TVA has prepared a draft EIS to analyze the 2019 IRP's potential impacts on the environment, economy and population in the Tennessee Valley. TVA released the draft EIS as Volume II on Feb. 15, and stakeholders and the public are invited to comment through April 8.

What are key findings included in the draft IRP?
Some of the key findings in the initial analysis are that:

- Additional resource capacity will be needed to serve customers in all future scenarios, in part to replace expiring or retiring capacity.
- Solar will play a substantial role in expansion, beginning in the mid-2020 time frame.
- Gas, storage and demand response are added in varying amounts, as they ensure reliability at times of peak demand and provide flexibility.
- There is no immediate need for TVA to add baseload resources that are designed to operate around the clock.
- Key considerations when evaluating coal retirements are uncertainty around future environmental standards for CO_2 emissions and the outlook for load and gas prices.
- Energy Efficiency levels are relatively similar across portfolios and decrease over time as efficiency impacts from codes and standards increase over time.

2019 IRP Frequently Asked Questions

Does the draft IRP have a particular area of focus?
The 2019 draft IRP emphasizes the importance of flexibility in response to the changing energy marketplace. TVA evaluated a wide range of possible futures and how flexible the power system needs to be to ensure reliable power at the lowest system cost. These possible futures include increasing renewables and distributed energy resources (DER), driven by technology advancements as well as the improving economics and accessibility of those technologies.

Why is TVA focused on flexibility?
TVA is focused on flexibility because it needs a diverse power-generation system that is well-positioned to meet future demand; has the capacity to incorporate renewable energy sources and DER along with more traditional resources; and has the capability to respond in a variety of circumstances well into the future.

Why is the IRP important?
The utility marketplace is changing rapidly, and long-range planning is necessary to guide TVA's decisions about power generation. The IRP also will inform TVA's next Long-Range Financial Plan.

Where can I read a copy of the draft?
Please click here to read the draft IRP and EIS.

2 – Public Involvement

How can I learn more about — and comment on — the draft?
TVA is offering numerous ways for the public to learn more about the draft and to provide input. An interactive report about the IRP is available via the IRP webpage, and public comments can be uploaded there, too. TVA will host a public webinar on Feb. 26 and a series of public meetings across the Tennessee Valley during the comment period.

How can I attend the public webinar?
The public webinar will be held on Feb 26, 2019, at 11 a.m. EST. Please register here. A recorded version is planned to be included on www.tva.com/irp.

Where will the public meetings be held?
Public meetings will be held on:

- **Feb. 19** from 4:30 to 6 p.m. CST in Murfreesboro, Tenn. (This will be an open house and listening session with the Regional Energy Resource Council. The full RERC meeting, which begins at 1 p.m. CST, is open to the public.)
- **Feb. 27** from 5 to 6:30 p.m. in Knoxville, Tenn.
- **March 18** from 5 to 6:30 p.m. in Memphis, Tenn.
- **March 19** from 5 to 6:30 p.m. in Huntsville, Ala.
- **March 20** from 5 to 6:30 p.m. in Chattanooga, Tenn.
- **March 26** from 5 to 6:30 p.m. in Bowling Green, Ky.

2019 IRP Frequently Asked Questions

Can you provide the specific meeting locations?
Please see the information in the box below.

Date	City	Address
Feb 19, 2019, 4:30 – 6:00 PM CT *(as part of TVA RERC Meeting)*	Murfreesboro, TN	Embassy Suites Hotel 1200 Conference Center Boulevard Murfreesboro, TN 37129 Oakleigh Room
Feb. 26, 11 to 11:45 a.m.	Public webinar	Please register here.
Feb 27, 2019, 5 to 6:30 p.m. ET	Knoxville, TN	Cansler YMCA 616 Jessamine Street Knoxville, TN 37917 Community Room
March 18, 2019, 5 to 6:30 p.m. CT	Memphis, TN	Benjamin J. Hooks Central Library 3030 Poplar Avenue Memphis, TN 38111 Meeting Room
March 19, 2019, 5 to 6:30 p.m. CT	Huntsville, AL	Huntsville Chamber of Commerce 225 Church Street NW Huntsville, AL 35801
March 20, 2019, 5 to 6:30 p.m. ET	Chattanooga, TN	Battle Academy 1601 Market Street Chattanooga, TN 37408 Gymnasium
March 26, 2019, 5 to 6:30 p.m. CT	Bowling Green, KY	Western Kentucky University Knicely Conference Center 2355 Nashville Road Bowling Green, KY 42101 Regency Room

How are my comments helpful to TVA?
Your comments will help TVA shape the IRP, which means you have the ability to influence how power supply needs of the Valley are met for the next 20 years, and thereby make a difference in life in the Valley.

3 — Collaboration With Customers and Stakeholders

Has TVA worked with external stakeholders?
TVA has engaged external stakeholders to understand diverse opinions and to challenge assumptions. TVA established the IRP Working Group (IRPWG), whose 20 members represent

diverse interests in the Valley. The IRPWG has met almost monthly, and its members have provided their respective views throughout the process. TVA also presented IRP progress updates to the Regional Energy Resource Council (RERC), a federal advisory committee that provides advice to the TVA Board on a range of energy-related matters, including the IRP.

What was the process for creating the IRP Working Group and who are the members?
The IRP Working Group is comprised of individuals from local power companies, directly served customers, industry groups, environmental and energy advocacy groups, academia, research institutions, community and sustainability representatives, and business and economic development professionals. The members represent the broad perspectives of those who live and work in the Valley.

Can you offer a more specific breakdown of the representatives in the 2019 IRP Working Group?
The 2019 IRP Working Group includes both customer and stakeholder representatives. There are eight customer representatives, including:

- Three local power companies
- Three industrial customers
- Two organizations representing local power companies and industrial customers

There are 12 stakeholder representatives, including:

- Three energy and environmental non-governmental organizations
- Three from research and academia with expertise in distributed energy resources (DERs)
- Two from state government
- Two representing economic development
- Two representing community and sustainability interests

The IRP Working Group reflects the geographic diversity and interested groups of the Tennessee Valley.

4 — IRP and EIS Timing and Timeline

What has the IRP planning process entailed to date?

2019 IRP Frequently Asked Questions

TVA and its stakeholders started the IRP planning process in February 2018. In the past year, the process has included:

- A 60-day public scoping period in spring 2018 to obtain public comments on the scope of the effort to develop the IRP.
- After extensive research, discussion and consideration of scoping comments, TVA, in coordination with the IRPWG, identified six scenarios — future worlds outside TVA's control — that might alter its operating environment and affect the cost of electricity and possible resources over the next 20 years.
- In coordination with the IRPWG, TVA also developed five business strategies that TVA could apply in the future to provide power in each scenario.
- An extensive computer modeling process applied each strategy to each scenario, resulting in 30 "resource portfolios."
- The draft IRP and EIS were released on Feb. 15, 2019. The draft IRP includes information on each portfolio, and the draft EIS assesses the impact of each portfolio on the environment, economy and population in the Tennessee Valley.

What happens next?
TVA will review and address public comments received on or before the close of the comment period on April 8, 2019. After public input is incorporated, the final IRP and EIS with a specific recommendation will be made available to the public for at least 30 days before it is presented to the TVA Board of Directors for approval. TVA expects to request approval of the IRP Recommendation from the Board in August 2019. Once approved, a Record of Decision will be published.

Can you provide a quick look at the timeline?
Developing the IRP is a long process. The timeline includes:

60-day EIS public scoping period	February 15 to April 16, 2018
Public scoping meetings	February 2018 - March 2018
Modeling, analysis and public updates	June 2018 - January 2019
Draft EIS and IRP published	February 2019
Public meetings & comment period	February 15 to April 8, 2019
Refinement of analysis, public updates	Early Summer 2019
Publication of EIS and IRP	Summer 2019

How were the comments during the scoping phase of the IRP process used?
Comments received during the scoping period helped TVA identify issues important to the public, and they helped lay the foundation for development of the IRP and the EIS. Click here for the Scoping Report.

5 — Integrated Resource Plan (IRP) Overview

What is the purpose of the IRP?
The IRP will consider many views of the future to help determine how TVA can continue to provide safe, reliable energy at the lowest feasible rate; support environmental stewardship; and

foster economic development in the Valley over the next 20 years. The IRP process examines a variety of economic, regulatory and market-driven scenarios (outside TVA's control) and strategies (within TVA's control) to help TVA respond to changing energy demands while continuing to provide reliable power at the lowest possible cost. The IRP is like a compass, not a GPS, in that it provides a broad direction and not a direct route.

How does TVA define "customer?"
Customers are businesses that TVA sells power to, including local power companies and industrial customers. As the nation's largest public power provider, TVA delivers safe, reliable, clean, competitively priced electricity to 154 local power companies and 58 directly served customers.

How will the IRP address local impacts?
The IRP is a high-level, broad planning process, and generally does not delve into local, site-specific impacts. TVA evaluates local impacts in future documents, after a specific proposal is developed.

How will the IRP impact people with limited incomes?
A primary focus area of the IRP is least-cost planning. The IRP process considers, "How can TVA provide reliable service for the lowest cost?" That focus is in the best interest of all customers, especially customers with limited incomes. TVA also is preparing a programmatic Environmental Impact Statement (EIS) to assess the impacts associated with the implementation of the updated IRP. Among other factors, the EIS will evaluate socioeconomic impact and environmental justice to ensure that decisions in the IRP will not have a negative impact on disadvantaged communities.

6 — Considerations in the IRP

Can you explain what is meant by DERs?
Distributed Energy Resources (DER) include resources and services such as generation sources (including renewable power sources) connected to the distribution system, energy storage, demand response, and energy efficiency programs.

Will the new IRP consider additional renewable power sources?
TVA's 2019 IRP will consider many views of the future and different generation resources, including coal, natural gas, nuclear, hydro, solar and other renewables that can be used — along with energy efficiency and other distributed energy resources — to meet future electricity demand. TVA also will consider how its current generating sources can best be used to meet demand. TVA approaches this plan focused on the best way to ensure reliability and meet power demand at the lowest feasible cost.

Will TVA set a standard for the relative quantity of renewables?
Renewable energy will be a key resource in TVA's future energy mix. With TVA's planning approach, all resources including renewables are on a level playing field where their individual characteristics and strengths will play in the model to determine an optimal portfolio. Some states have renewable portfolio standards which mandate a certain amount of renewables. For

most of the TVA region, such mandated levels do not exist, so we are free to allow the resource characteristics to interact in the model to determine an optimal level of specific resources. TVA has several criteria for an optimal resource plan: low cost, risk informed, environmentally responsible, reliable, diverse and flexible. The optimal plan will be one that best meets all criteria.

How will the IRP define renewables use?
Since the IRP is more like a compass than a GPS, it will directionally define ranges of renewables that could be added by a future date, but it will not define specific locations for renewables. TVA will be focused on the best way to ensure reliability and meet power demand at the lowest feasible cost.

Will TVA consider a strategy to incentivize more DER implementation in the Valley?
TVA evaluated traditional and distributed resources in this IRP. Strategy B (Promote DER) tests the impact of incenting DER to achieve higher, long-term penetration levels in the Valley. TVA will look at the cost, value and impact of these resources on its load shape. TVA will continue to look at portfolios of DER resources that can create the best value to all ratepayers.

How will nuclear figure into the process?
TVA operates an 8,000 MW nuclear fleet today. Four of TVA's seven nuclear units will need to be relicensed between 2033 and 2036, which is within the 20-year study window of this IRP. The 2019 IRP evaluated how optimal generation portfolios would be affected by the decision to relicense those units. TVA considered a variety of power generation of resources in the IRP, including large and small-scale nuclear technologies.

Is TVA considering small modular nuclear reactors?
TVA is considering small modular reactors (SMRs) as part of the IRP and its power mix. TVA is committed to nuclear power as a key source of low-cost, carbon-free electricity within a balanced energy generation mix, and small modular reactors could provide an option for clean base-load energy for TVA's generation portfolio.

Will the IRP or the EIS address any recommended changes to the Hydro discharges, specifically the "guaranteed" minimum reservoir flows?
While the IRP will have metrics around water use, considerations such as changes to minimum reservoir flows, hydro discharges and river management practices are outside the scope of the IRP and are better addressed through other programmatic efforts such as TVA's Reservoir Operations Study.

Where do electric vehicles and associated charging infrastructure fall within the IRP?
In general, this falls under electrification and a sector that could increase demand for electricity, but specific locations for charging infrastructure will not be an outcome of the IRP.

How does the IRP process consider uncertainties?
Considering uncertainties is an important part of the planning process, because uncertainties can impact electricity demand as well as costs or performance of certain energy resources. TVA identified uncertainties and used them as building blocks to construct the scenarios, which are

situations beyond TVA's control that could impact power generation. TVA's list of proposed uncertainties for the 2019 IRP includes electricity demand, market power price, natural gas prices, coal prices, solar prices, storage prices, regulations, CO2 regulation/price, distributed generation penetration, energy efficiency adoption and economic outlook (national and regional).

Is there a difference between reliability and resiliency?
Yes. Reliability addresses the ability to meet electricity demand reliably, while resiliency is an aspect of reliability that addresses more specifically the ability to withstand and recover from weather and other external disruptions. Both reliability and resiliency are critical for serving customer needs. TVA has a diverse system that is well-positioned to meet demand, and the IRP helps TVA evaluate what the future may look like and how flexible the system may need to be to ensure reliability and resiliency.

Will TVA evaluate resiliency in this IRP?
Resiliency is a critical aspect of providing power. Cybersecurity measures and investments to harden transmission and distribution systems are examples of some ways to improve resiliency, but they are outside the scope of the IRP. A system that is flexible in its ability to respond to dynamic loads is more resilient. While the IRP takes a systemwide view and will not be location-specific, flexibility of potential portfolios will be evaluated.

7 — Environmental Impact Statement (EIS) Overview

Will TVA consider environmental impacts of the IRP?
Yes. As part of the study, TVA will prepare a programmatic Environmental Impact Statement (EIS) to assess the natural, cultural and socioeconomic impacts associated with the implementation of the updated IRP. It released the draft EIS on Feb. 15, 2019.

What effects are evaluated in the draft EIS?
The effects examined in the draft EIS include:

- Emissions of greenhouse gases
- Fuel consumption
- Air quality
- Water quality and quantity
- Waste generation and disposal
- Land use
- Ecological
- Cultural resources
- Socioeconomic impacts and environmental justice.

What does the scope of the draft EIS include?
The draft EIS analyzes and identifies the relationship of the human environment and economy to each of the different scenarios and strategies being considered in the IRP.

What are the environmental impacts identified in the draft EIS?
The draft EIS identified that:

- Under all the portfolios, there is a need for new capacity with a significant expansion of solar generation overall.
- Uncertainty around future environmental standards for carbon dioxide emissions, along with the outlook for loads and gas prices, are key considerations when evaluating potential coal retirements.
- Emissions of air pollutants, the intensity of greenhouse gas emissions and generation of coal waste decrease under all strategies.
- Strategies focused on resiliency, load shape and renewables have the largest amounts of solar and storage expansion and coal retirements, resulting in lower environmental impact overall but higher land use.
- For most environmental resources, the impacts are greatest for the No Action alternative. The exception is the land area required for new generating facilities, which is greater for the action alternatives, particularly strategies which focus on resiliency, load shape and renewables.

Does the draft EIS consider the CO_2 emissions and global warming impacts of the various IRP scenarios? If so, how?
The draft EIS considers CO_2 and global warming impacts, and portfolios have been evaluated against metrics to determine the environmental impact. The draft EIS addresses the effects of power production on the environment, including climate change, the effects of climate change on the Valley, and air emissions and water use in TVA's power operations.

8 — 2015 IRP

Will there be a review of how TVA has implemented the 2015 IRP?
TVA continues to use the 2015 IRP as a guide as it makes decisions. The future has changed significantly since the 2015 IRP in regards to factors such as load and commodity price forecasts and technology improvements. As TVA analyzes potential future changes to the resource mix in the 2019 IRP, the previous power supply ranges from the 2015 will be considered in those evaluations. The 2015 IRP power supply ranges will continue to remain in place until a Record of Decision is issued on the 2019 IRP recommendation.

Does TVA benchmark the resource planning processes and modeling used by other utilities across the country? How does that impact the IRP process?
Yes, TVA reviews other utility plans and collaborates with utility industry peers and partners to benchmark their resource planning modeling processes. For example, TVA evaluates how other utilities achieve flexibility and how they use distributed energy resources, and it considers its findings during the IRP process. Since TVA's IRP cannot directly match some of the assumptions and processes that others use, as part of its benchmarking, TVA considers the variations in climate, power demands and state regulation that other utilities incorporate in their planning. Further, TVA utilizes a third party to review and validate assumptions that go into the modeling process.

2019 IRP Frequently Asked Questions

Does TVA use a backcasting or verification protocol to improve the accuracy of its forecasts?
Forecasting accuracy is important. TVA backcasts to determine how the forecast would have been different with actual input. The industry as a whole has seen a structural break in the relationship of economic drivers like GDP to load forecasts, prompting TVA and other utilities to recalibrate forecasting models to account for that change and other emerging trends and drivers.

Where can I find more information about the 2015 IRP?
Information is available on TVA's 2015 IRP webpage.